

# SEQUENCE LISTING

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<120> Chimeric G-Proteins And Uses Thereof

<130> 59896

<140>

<141>

<160> 45

<170> PatentIn Ver. 2.1

<210> 1

<211> 355

<212> PRT

<213> C. elegans

<400> 1

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Gln Glu Ile Glu Lys Gln Leu Gln Arg Asp Lys Arg Asn Ala Arg Arg  
20 25 30

Glu Leu Lys Leu Leu Leu Leu Gly Thr Gly Glu Ser Gly Lys Ser Thr  
35 40 45

Phe Ile Lys Gln Met Arg Ile Ile His Gly Gln Gly Tyr Ser Glu Glu  
50 55 60

Asp Lys Arg Ala His Ile Arg Leu Val Tyr Gln Asn Val Phe Met Ala  
65 70 75 80

Ile Gln Ser Met Ile Arg Ala Met Asp Thr Leu Asp Ile Lys Phe Gly  
85 90 95

Asn Glu Ser Glu Glu Leu Gln Glu Lys Ala Ala Val Val Arg Glu Val  
100 105 110

Asp Phe Glu Ser Val Thr Ser Phe Glu Glu Pro Tyr Val Ser Tyr Ile  
115 120 125

Lys Glu Leu Trp Glu Asp Ser Gly Ile Gln Glu Cys Tyr Asp Arg Arg  
 130 135 140

Arg Glu Tyr Gln Leu Thr Asp Ser Ala Lys Tyr Tyr Leu Ser Asp Leu  
 145 150 155 160

Arg Arg Leu Ala Val Pro Asp Tyr Leu Pro Thr Glu Gln Asp Ile Leu  
 165 170 175

Arg Val Arg Val Pro Thr Thr Gly Ile Ile Glu Tyr Pro Phe Asp Leu  
 180 185 190

Glu Gln Ile Ile Phe Arg Met Val Asp Val Gly Gly Gln Arg Ser Glu  
 195 200 205

Arg Arg Lys Trp Ile His Cys Phe Glu Asn Val Thr Ser Ile Met Phe  
 210 215 220

Leu Val Ala Leu Ser Glu Tyr Asp Gln Val Leu Val Glu Cys Asp Asn  
 225 230 235 240

Glu Asn Arg Met Glu Glu Ser Lys Ala Leu Phe Arg Thr Ile Ile Thr  
 245 250 255

Tyr Pro Trp Phe Thr Asn Ser Ser Val Ile Leu Phe Leu Asn Lys Lys  
 260 265 270

Asp Leu Leu Glu Glu Lys Ile Leu Tyr Ser His Leu Ala Asp Tyr Phe  
 275 280 285

Pro Glu Tyr Asp Gly Pro Pro Arg Asp Pro Ile Ala Ala Arg Glu Phe  
 290 295 300

Ile Leu Lys Met Phe Val Asp Leu Asn Pro Asp Ala Asp Lys Ile Ile  
 305 310 315 320

Tyr Ser His Phe Thr Cys Ala Thr Asp Thr Glu Asn Ile Arg Phe Val  
 325 330 335

Phe Ala Ala Val Lys Asp Thr Ile Leu Gln His Asn Leu Lys Tyr Ile  
 340 345 350

Gly Leu Cys  
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<210> 2

<211> 355  
<212> PRT  
<213> C. elegans

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Met Ala Cys Cys Leu Ser Glu Glu Ala Arg Glu Gln Lys Arg Ile Asn  
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Gln Glu Ile Glu Lys Gln Leu Gln Arg Asp Lys Arg Asn Ala Arg Arg  
20 25 30

Glu Leu Lys Leu Leu Leu Leu Gly Thr Gly Glu Ser Gly Lys Ser Thr  
35 40 45

Phe Ile Lys Gln Met Arg Ile Ile His Gly Gln Gly Tyr Ser Glu Glu  
50 55 60

Asp Lys Arg Ala His Ile Arg Leu Val Tyr Gln Asn Val Phe Met Ala  
65 70 75 80

Ile Gln Ser Met Ile Arg Ala Met Asp Thr Leu Asp Ile Lys Phe Gly  
85 90 95

Asn Glu Ser Glu Glu Leu Gln Glu Lys Ala Ala Val Val Arg Glu Val  
100 105 110

Asp Phe Glu Ser Val Thr Ser Phe Glu Glu Pro Tyr Val Ser Tyr Ile  
115 120 125

Lys Glu Leu Trp Glu Asp Ser Gly Ile Gln Glu Cys Tyr Asp Arg Arg  
130 135 140

Arg Glu Tyr Gln Leu Thr Asp Ser Ala Lys Tyr Tyr Leu Ser Asp Leu  
145 150 155 160

Arg Arg Leu Ala Val Pro Asp Tyr Leu Pro Thr Glu Gln Asp Ile Leu  
165 170 175

Arg Val Arg Val Pro Thr Thr Gly Ile Ile Glu Tyr Pro Phe Asp Leu  
180 185 190

Glu Gln Ile Ile Phe Arg Met Val Asp Val Gly Gly Gln Arg Ser Glu  
195 200 205

Arg Arg Lys Trp Ile His Cys Phe Glu Asn Val Thr Ser Ile Met Phe  
210 215 220

Leu Val Ala Leu Ser Glu Tyr Asp Gln Val Leu Val Glu Cys Asp Asn

225                      230                      235                      240  
 Glu Asn Arg Met Glu Glu Ser Lys Ala Leu Phe Arg Thr Ile Ile Thr  
                          245                      250                      255  
 Tyr Pro Trp Phe Thr Asn Ser Ser Val Ile Leu Phe Leu Asn Lys Lys  
                          260                      265                      270  
 Asp Leu Leu Glu Glu Lys Ile Leu Tyr Ser His Leu Ala Asp Tyr Phe  
                          275                      280                      285  
 Pro Glu Tyr Asp Gly Pro Pro Arg Asp Pro Ile Ala Ala Arg Glu Phe  
                          290                      295                      300  
 Ile Leu Lys Met Phe Val Asp Leu Asn Pro Asp Ala Asp Lys Ile Ile  
 305                      310                      315                      320  
 Tyr Ser His Phe Thr Cys Ala Thr Asp Thr Glu Asn Ile Arg Phe Val  
                          325                      330                      335  
 Phe Ala Ala Val Lys Asp Thr Ile Leu Gln Asn Asn Leu Lys Tyr Ile  
                          340                      345                      350  
 Gly Leu Cys  
                          355

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 <213> C. elegans

<400> 3  
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   1                          5                          10                          15  
 Gln Glu Ile Glu Lys Gln Leu Gln Arg Asp Lys Arg Asn Ala Arg Arg  
                           20                          25                          30  
 Glu Leu Lys Leu Leu Leu Leu Gly Thr Gly Glu Ser Gly Lys Ser Thr  
                           35                          40                          45  
 Phe Ile Lys Gln Met Arg Ile Ile His Gly Gln Gly Tyr Ser Glu Glu  
                           50                          55                          60  
 Asp Lys Arg Ala His Ile Arg Leu Val Tyr Gln Asn Val Phe Met Ala  
   65                          70                          75                          80

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ile | Gln | Ser | Met | Ile | Arg | Ala | Met | Asp | Thr | Leu | Asp | Ile | Lys | Phe | Gly | 85  | 90  | 95  |
| Asn | Glu | Ser | Glu | Glu | Leu | Gln | Glu | Lys | Ala | Ala | Val | Val | Arg | Glu | Val | 100 | 105 | 110 |
| Asp | Phe | Glu | Ser | Val | Thr | Ser | Phe | Glu | Glu | Pro | Tyr | Val | Ser | Tyr | Ile | 115 | 120 | 125 |
| Lys | Glu | Leu | Trp | Glu | Asp | Ser | Gly | Ile | Gln | Glu | Cys | Tyr | Asp | Arg | Arg | 130 | 135 | 140 |
| Arg | Glu | Tyr | Gln | Leu | Thr | Asp | Ser | Ala | Lys | Tyr | Tyr | Leu | Ser | Asp | Leu | 145 | 150 | 155 |
| Arg | Arg | Leu | Ala | Val | Pro | Asp | Tyr | Leu | Pro | Thr | Glu | Gln | Asp | Ile | Leu | 165 | 170 | 175 |
| Arg | Val | Arg | Val | Pro | Thr | Thr | Gly | Ile | Ile | Glu | Tyr | Pro | Phe | Asp | Leu | 180 | 185 | 190 |
| Glu | Gln | Ile | Ile | Phe | Arg | Met | Val | Asp | Val | Gly | Gly | Gln | Arg | Ser | Glu | 195 | 200 | 205 |
| Arg | Arg | Lys | Trp | Ile | His | Cys | Phe | Glu | Asn | Val | Thr | Ser | Ile | Met | Phe | 210 | 215 | 220 |
| Leu | Val | Ala | Leu | Ser | Glu | Tyr | Asp | Gln | Val | Leu | Val | Glu | Cys | Asp | Asn | 225 | 230 | 235 |
| Glu | Asn | Arg | Met | Glu | Glu | Ser | Lys | Ala | Leu | Phe | Arg | Thr | Ile | Ile | Thr | 245 | 250 | 255 |
| Tyr | Pro | Trp | Phe | Thr | Asn | Ser | Ser | Val | Ile | Leu | Phe | Leu | Asn | Lys | Lys | 260 | 265 | 270 |
| Asp | Leu | Leu | Glu | Glu | Lys | Ile | Leu | Tyr | Ser | His | Leu | Ala | Asp | Tyr | Phe | 275 | 280 | 285 |
| Pro | Glu | Tyr | Asp | Gly | Pro | Pro | Arg | Asp | Pro | Ile | Ala | Ala | Arg | Glu | Phe | 290 | 295 | 300 |
| Ile | Leu | Lys | Met | Phe | Val | Asp | Leu | Asn | Pro | Asp | Ala | Asp | Lys | Ile | Ile | 305 | 310 | 315 |
| Tyr | Ser | His | Phe | Thr | Cys | Ala | Thr | Asp | Thr | Glu | Asn | Ile | Arg | Phe | Val | 325 | 330 | 335 |

Phe Ala Ala Val Lys Asp Thr Ile Leu Gln Met His Leu Arg Gln Tyr  
 340 345 350

Glu Leu Leu  
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<210> 4  
 <211> 355  
 <212> PRT  
 <213> C. elegans

<400> 4  
 Met Ala Cys Cys Leu Ser Glu Glu Ala Arg Glu Gln Lys Arg Ile Asn  
 1 5 10 15

Gln Glu Ile Glu Lys Gln Leu Gln Arg Asp Lys Arg Asn Ala Arg Arg  
 20 25 30

Glu Leu Lys Leu Leu Leu Leu Gly Thr Gly Glu Ser Gly Lys Ser Thr  
 35 40 45

Phe Ile Lys Gln Met Arg Ile Ile His Gly Gln Gly Tyr Ser Glu Glu  
 50 55 60

Asp Lys Arg Ala His Ile Arg Leu Val Tyr Gln Asn Val Phe Met Ala  
 65 70 75 80

Ile Gln Ser Met Ile Arg Ala Met Asp Thr Leu Asp Ile Lys Phe Gly  
 85 90 95

Asn Glu Ser Glu Glu Leu Gln Glu Lys Ala Ala Val Val Arg Glu Val  
 100 105 110

Asp Phe Glu Ser Val Thr Ser Phe Glu Glu Pro Tyr Val Ser Tyr Ile  
 115 120 125

Lys Glu Leu Trp Glu Asp Ser Gly Ile Gln Glu Cys Tyr Asp Arg Arg  
 130 135 140

Arg Glu Tyr Gln Leu Thr Asp Ser Ala Lys Tyr Tyr Leu Ser Asp Leu  
 145 150 155 160

Arg Arg Leu Ala Val Pro Asp Tyr Leu Pro Thr Glu Gln Asp Ile Leu  
 165 170 175

Arg Val Arg Val Pro Thr Thr Gly Ile Ile Glu Tyr Pro Phe Asp Leu  
 180 185 190

Glu Gln Ile Ile Phe Arg Met Val Asp Val Gly Gly Gln Arg Ser Glu  
 195 200 205

Arg Arg Lys Trp Ile His Cys Phe Glu Asn Val Thr Ser Ile Met Phe  
 210 215 220

Leu Val Ala Leu Ser Glu Tyr Asp Gln Val Leu Val Glu Cys Asp Asn  
 225 230 235 240

Glu Asn Arg Met Glu Glu Ser Lys Ala Leu Phe Arg Thr Ile Ile Thr  
 245 250 255

Tyr Pro Trp Phe Thr Asn Ser Ser Val Ile Leu Phe Leu Asn Lys Lys  
 260 265 270

Asp Leu Leu Glu Glu Lys Ile Leu Tyr Ser His Leu Ala Asp Tyr Phe  
 275 280 285

Pro Glu Tyr Asp Gly Pro Pro Arg Asp Pro Ile Ala Ala Arg Glu Phe  
 290 295 300

Ile Leu Lys Met Phe Val Asp Leu Asn Pro Asp Ala Asp Lys Ile Ile  
 305 310 315 320

Tyr Ser His Phe Thr Cys Ala Thr Asp Thr Glu Asn Ile Arg Arg Val  
 325 330 335

Phe Asn Asp Cys Arg Asp Ile Ile Gln Arg Met His Leu Arg Gln Tyr  
 340 345 350

Glu Leu Leu  
 355

<210> 5  
 <211> 355  
 <212> PRT  
 <213> C. elegans

<400> 5  
 Met Ala Cys Cys Leu Ser Glu Glu Ala Arg Glu Gln Lys Arg Ile Asn  
 1 5 10 15

Gln Glu Ile Glu Lys Gln Leu Gln Arg Asp Lys Arg Asn Ala Arg Arg  
 20 25 30

Glu Leu Lys Leu Leu Leu Leu Gly Thr Gly Glu Ser Gly Lys Ser Thr

45

Pro Glu Tyr Asp Gly Pro Pro Arg Asp Pro Ile Ala Ala Arg Glu Phe



290 295 300

Ile Leu Lys Met Phe Val Asp Leu Asn Pro Asp Ala Asp Lys Ile Ile  
 305 310 315 320

Tyr Ser His Phe Thr Cys Ala Thr Asp Thr Glu Asn Ile Arg Phe Val  
 325 330 335

Phe Ala Ala Val Lys Asp Thr Ile Leu Gln His Asn Leu Lys Glu Cys  
 340 345 350

Gly Leu Tyr  
 355

<210> 6  
 <211> 359  
 <212> PRT  
 <213> Homo sapiens

<400> 6

Met Thr Leu Glu Ser Ile Met Ala Cys Cys Leu Ser Glu Glu Ala Lys  
 1 5 10 15

Glu Ala Arg Arg Ile Asn Asp Glu Ile Glu Arg Gln Leu Arg Arg Asp  
 20 25 30

Lys Arg Asp Ala Arg Arg Glu Leu Lys Leu Leu Leu Leu Gly Thr Gly  
 35 40 45

Glu Ser Gly Lys Ser Thr Phe Ile Lys Gln Met Arg Ile Ile His Gly  
 50 55 60

Ser Gly Tyr Ser Asp Glu Asp Lys Arg Gly Phe Thr Lys Leu Val Tyr  
 65 70 75 80

Gln Asn Ile Phe Thr Ala Met Gln Ala Met Ile Arg Ala Met Asp Thr  
 85 90 95

Leu Lys Ile Pro Tyr Lys Tyr Glu His Asn Lys Ala His Ala Gln Leu  
 100 105 110

Val Arg Glu Val Asp Val Glu Lys Val Ser Ala Phe Glu Asn Pro Tyr  
 115 120 125

Val Asp Ala Ile Lys Ser Leu Trp Asn Asp Pro Gly Ile Gln Glu Cys  
 130 135 140

Tyr Asp Arg Arg Arg Glu Tyr Gln Leu Ser Asp Ser Thr Lys Tyr Tyr  
 145 150 155 160

Leu Asn Asp Leu Asp Arg Val Ala Asp Pro Ala Tyr Leu Pro Thr Gln  
 165 170 175

Gln Asp Val Leu Arg Val Arg Val Pro Thr Thr Gly Ile Ile Glu Tyr  
 180 185 190

Pro Phe Asp Leu Gln Ser Val Ile Phe Arg Met Val Asp Val Gly Gly  
 195 200 205

Gln Arg Ser Glu Arg Arg Lys Trp Ile His Cys Phe Glu Asn Val Thr  
 210 215 220

Ser Ile Met Phe Leu Val Ala Leu Ser Glu Tyr Asp Gln Val Leu Val  
 225 230 235 240

Glu Ser Asp Asn Glu Asn Arg Met Glu Glu Ser Lys Ala Leu Phe Arg  
 245 250 255

Thr Ile Ile Thr Tyr Pro Trp Phe Gln Asn Ser Ser Val Ile Leu Phe  
 260 265 270

Leu Asn Lys Lys Asp Leu Leu Glu Glu Lys Ile Met Tyr Ser His Leu  
 275 280 285

Val Asp Tyr Phe Pro Glu Tyr Asp Gly Pro Gln Arg Asp Ala Gln Ala  
 290 295 300

Ala Arg Glu Phe Ile Leu Lys Met Phe Val Asp Leu Asn Pro Asp Ser  
 305 310 315 320

Asp Lys Ile Ile Tyr Ser His Phe Thr Cys Ala Thr Asp Thr Glu Asn  
 325 330 335

Ile Arg Phe Val Phe Ala Ala Val Lys Asp Thr Ile Leu Gln Leu Asn  
 340 345 350

Leu Lys Glu Tyr Asn Ala Val  
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<210> 7

<211> 359

<212> PRT

<213> Canis familiaris

<400> 7

Met Thr Leu Glu Ser Ile Met Ala Cys Cys Leu Ser Glu Glu Ala Lys  
1 5 10 15

Glu Ala Arg Arg Ile Asn Asp Glu Ile Glu Arg Gln Leu Arg Arg Asp  
20 25 30

Lys Arg Asp Ala Arg Arg Glu Leu Lys Leu Leu Leu Leu Gly Thr Gly  
35 40 45

Glu Ser Gly Lys Ser Thr Phe Ile Lys Gln Met Arg Ile Ile His Gly  
50 55 60

Ser Gly Tyr Ser Asp Glu Asp Lys Arg Gly Phe Thr Lys Leu Val Tyr  
65 70 75 80

Gln Asn Ile Phe Thr Ala Met Gln Ala Met Ile Arg Ala Met Asp Thr  
85 90 95

Leu Lys Ile Pro Tyr Lys Tyr Glu His Asn Lys Ala His Ala Gln Leu  
100 105 110

Val Arg Glu Val Asp Val Glu Lys Val Ser Ala Phe Glu Asn Pro Tyr  
115 120 125

Val Asp Ala Ile Lys Ser Leu Trp Asn Asp Pro Gly Ile Gln Glu Cys  
130 135 140

Tyr Asp Arg Arg Arg Glu Tyr Gln Leu Ser Asp Ser Thr Lys Tyr Tyr  
145 150 155 160

Leu Asn Asp Leu Asp Arg Val Ala Asp Pro Ala Tyr Leu Pro Thr Gln  
165 170 175

Gln Asp Val Leu Arg Val Arg Val Pro Thr Thr Gly Ile Ile Glu Tyr  
180 185 190

Pro Phe Asp Leu Gln Ser Val Ile Phe Arg Met Val Asp Val Gly Gly  
195 200 205

Gln Arg Ser Glu Arg Arg Lys Trp Ile His Cys Phe Glu Asn Val Thr  
210 215 220

Ser Ile Met Phe Leu Val Ala Leu Ser Glu Tyr Asp Gln Val Leu Val  
225 230 235 240

Glu Ser Asp Asn Glu Asn Arg Met Glu Glu Ser Lys Ala Leu Phe Arg  
245 250 255

Thr Ile Ile Thr Tyr Pro Trp Phe Gln Asn Ser Ser Val Ile Leu Phe  
 260 265 270

Leu Asn Lys Lys Asp Leu Leu Glu Glu Lys Ile Met Tyr Ser His Leu  
 275 280 285

Val Asp Tyr Phe Pro Glu Tyr Asp Gly Pro Gln Arg Asp Ala Gln Ala  
 290 295 300

Ala Arg Glu Phe Ile Leu Lys Met Phe Val Asp Leu Asn Pro Asp Ser  
 305 310 315 320

Asp Lys Ile Ile Tyr Ser His Phe Thr Cys Ala Thr Asp Thr Glu Asn  
 325 330 335

Ile Arg Phe Val Phe Ala Ala Val Lys Asp Thr Ile Leu Gln Leu Asn  
 340 345 350

Leu Lys Glu Tyr Asn Leu Val  
 355

<210> 8

<211> 359

<212> PRT

<213> Mus musculus

<400> 8

Met Thr Leu Glu Ser Ile Met Ala Cys Cys Leu Ser Glu Glu Ala Lys  
 1 5 10 15

Glu Ala Arg Arg Ile Asn Asp Glu Ile Glu Arg His Val Arg Arg Asp  
 20 25 30

Lys Arg Asp Ala Arg Arg Glu Leu Lys Leu Leu Leu Leu Gly Thr Gly  
 35 40 45

Glu Ser Gly Lys Ser Thr Phe Ile Lys Gln Met Arg Ile Ile His Gly  
 50 55 60

Ser Gly Tyr Ser Asp Glu Asp Lys Arg Gly Phe Thr Lys Leu Val Tyr  
 65 70 75 80

Gln Asn Ile Phe Thr Ala Met Gln Ala Met Ile Arg Ala Met Asp Thr  
 85 90 95

Leu Lys Ile Pro Tyr Lys Tyr Glu His Asn Lys Ala His Ala Gln Leu

|   |     |     |
|---|-----|-----|
| 100   | 105 | 110 |
| Val Arg Glu Val Asp Val Glu Lys Val Ser Ala Phe Glu Asn Pro Tyr |     |     |
| 115   | 120 | 125 |
| Val Asp Ala Ile Lys Ser Leu Trp Asn Asp Pro Gly Ile Gln Glu Cys |     |     |
| 130   | 135 | 140 |
| Tyr Asp Arg Arg Arg Glu Tyr Gln Leu Ser Asp Ser Thr Lys Tyr Tyr |     |     |
| 145   | 150 | 155 |
| 160   |     |     |
| Leu Asn Asp Leu Asp Arg Val Ala Asp Pro Ser Tyr Leu Pro Thr Gln |     |     |
| 165   | 170 | 175 |
| Gln Asp Val Leu Arg Val Arg Val Pro Thr Thr Gly Ile Ile Glu Tyr |     |     |
| 180   | 185 | 190 |
| Pro Phe Asp Leu Gln Ser Val Ile Phe Arg Met Val Asp Val Gly Gly |     |     |
| 195   | 200 | 205 |
| Gln Arg Ser Glu Arg Arg Lys Trp Ile His Cys Phe Glu Asn Val Thr |     |     |
| 210   | 215 | 220 |
| Ser Ile Met Phe Leu Val Ala Leu Ser Glu Tyr Asp Gln Val Leu Val |     |     |
| 225   | 230 | 235 |
| 240   |     |     |
| Glu Ser Asp Asn Glu Asn Arg Met Glu Glu Ser Lys Ala Leu Phe Arg |     |     |
| 245   | 250 | 255 |
| Thr Ile Ile Thr Tyr Pro Trp Phe Gln Asn Ser Ser Val Ile Leu Phe |     |     |
| 260   | 265 | 270 |
| Leu Asn Lys Lys Asp Leu Leu Glu Glu Lys Ile Met Tyr Ser His Leu |     |     |
| 275   | 280 | 285 |
| Val Asp Tyr Phe Pro Glu Tyr Asp Gly Pro Gln Arg Asp Ala Gln Ala |     |     |
| 290   | 295 | 300 |
| Ala Arg Glu Phe Ile Leu Lys Met Phe Val Asp Leu Asn Pro Asp Ser |     |     |
| 305   | 310 | 315 |
| 320   |     |     |
| Asp Lys Ile Ile Tyr Ser His Phe Thr Cys Ala Thr Asp Thr Glu Asn |     |     |
| 325   | 330 | 335 |
| Ile Arg Phe Val Phe Ala Ala Val Lys Asp Thr Ile Leu Gln Leu Asn |     |     |
| 340   | 345 | 350 |
| Leu Lys Glu Tyr Asn Leu Val                                     |     |     |

<210> 9  
 <211> 359  
 <212> PRT  
 <213> *Xenopus laevis*

<400> 9

Met Thr Leu Glu Ser Ile Met Ala Cys Cys Leu Ser Glu Glu Ala Glu  
 1 5 10 15

Glu Ala Arg Arg Ile Asn Asp Glu Ile Glu Arg Gln Leu Arg Arg Asp  
 20 25 30

Lys Arg Asp Ala Arg Arg Glu Leu Lys Leu Leu Leu Gly Thr Gly  
 35 40 45

Glu Ser Gly Lys Ser Thr Phe Ile Lys Gln Met Arg Ile Ile His Gly  
 50 55 60

Ser Gly Tyr Ser Asp Glu Asp Lys Arg Gly Phe Thr Lys Leu Val Tyr  
 65 70 75 80

Gln Asn Ile Phe Ser Ala Met Gln Ala Met Ile Arg Ala Met Glu Thr  
 85 90 95

Leu Lys Ile Pro Tyr Lys Tyr Glu His Asn Lys Gly His Ala Leu Leu  
 100 105 110

Val Arg Glu Val Asp Val Glu Lys Val Ala Ser Phe Glu Asn Pro Tyr  
 115 120 125

Val Asp Ala Ile Lys Tyr Leu Trp Asn Asp Pro Gly Ile Gln Glu Cys  
 130 135 140

Tyr Asp Arg Arg Arg Glu Tyr Gln Leu Ser Asp Ser Thr Lys Tyr Tyr  
 145 150 155 160

Leu Asn Asp Leu Asp Arg Ile Ala Thr His Gly Tyr Leu Pro Thr Gln  
 165 170 175

Gln Asp Val Leu Arg Val Arg Val Pro Thr Thr Gly Ile Ile Glu Tyr  
 180 185 190

Pro Phe Asp Leu Gln Ser Val Ile Phe Arg Met Val Asp Val Gly Gly  
 195 200 205

Gln Arg Ser Glu Arg Arg Lys Trp Ile His Cys Phe Glu Asn Val Thr  
 210 215 220  
 Ser Ile Met Phe Leu Val Ala Leu Ser Glu Tyr Asp Gln Val Leu Val  
 225 230 235 240  
 Glu Ser Asp Asn Glu Asn Arg Met Glu Glu Ser Lys Ala Leu Phe Arg  
 245 250 255  
 Thr Ile Ile Thr Tyr Pro Trp Phe Gln Asn Ser Ser Val Ile Leu Phe  
 260 265 270  
 Leu Asn Lys Lys Asp Leu Leu Glu Glu Lys Ile Met Tyr Ser His Leu  
 275 280 285  
 Val Asp Tyr Phe Pro Glu Tyr Asp Gly Pro Gln Arg Asp Ala Gln Ala  
 290 295 300  
 Ala Arg Glu Phe Ile Leu Lys Met Phe Val Asp Leu Asn Pro Asp Ser  
 305 310 315 320  
 Asp Lys Ile Ile Tyr Ser His Phe Thr Cys Ala Thr Asp Thr Glu Asn  
 325 330 335  
 Ile Arg Phe Val Phe Ala Ala Val Lys Asp Thr Ile Leu Gln Leu Asn  
 340 345 350  
 Leu Lys Glu Tyr Asn Leu Val  
 355

<210> 10  
 <211> 353  
 <212> PRT  
 <213> Patinopecten yessoensis

<400> 10  
 Met Ala Cys Cys Leu Ser Glu Glu Ala Lys Glu Gln Lys Arg Ile Asn  
 1 5 10 15  
 Cys Glu Ile Glu Lys Glu Leu Arg Lys Ala Lys Arg Asp Ala Arg Arg  
 20 25 30  
 Glu Leu Lys Leu Leu Leu Leu Gly Thr Gly Glu Ser Gly Lys Ser Thr  
 35 40 45  
 Phe Ile Lys Gln Met Arg Ile Ile His Gly Thr Gly Tyr Ser Glu Glu  
 50 55 60

Asp Lys Arg Gly Phe Ile Lys Ile Val Tyr Gln Asn Ile Phe Met Ala  
 65 70 75 80  
 Met His Ser Met Ile Arg Ala Met Asp Thr Ile Lys Ile Ser Phe Glu  
 85 90 95  
 Val Ala Asp Asn Glu Glu Asn Ala Ile Met Ile Arg Gln Val Asp Tyr  
 100 105 110  
 Glu Thr Val Thr Thr Leu Asp Ser Gln Ser Val Glu Ala Ile Leu Ser  
 115 120 125  
 Leu Trp Ala Asp Ala Gly Ile Gln Glu Cys Tyr Asp Arg Arg Arg Glu  
 130 135 140  
 Tyr Gln Leu Thr Asp Ser Ala Lys Tyr Tyr Leu Asp Ala Val Asp Arg  
 145 150 155 160  
 Ile Ala Glu Pro Asn Tyr Leu Pro Thr Leu Gln Asp Ile Leu Arg Val  
 165 170 175  
 Arg Val Pro Thr Thr Gly Ile Ile Glu Tyr Pro Phe Asp Leu Asp Ser  
 180 185 190  
 Ile Ile Phe Arg Met Val Asp Val Gly Gly Gln Arg Ser Glu Arg Arg  
 195 200 205  
 Lys Trp Ile His Cys Phe Glu Asn Val Thr Ser Ile Met Phe Leu Val  
 210 215 220  
 Ala Leu Ser Glu Tyr Asp Gln Val Leu Val Glu Ser Asp Asn Glu Asn  
 225 230 235 240  
 Arg Met Glu Glu Ser Lys Ala Leu Phe Arg Thr Ile Ile Thr Tyr Pro  
 245 250 255  
 Trp Phe Gln Asn Ser Ser Val Ile Leu Phe Leu Asn Lys Lys Asp Leu  
 260 265 270  
 Leu Glu Glu Lys Ile Met His Ser His Leu Val Asp Tyr Phe Pro Glu  
 275 280 285  
 Phe Asp Gly Gln Lys Lys Asp Ala Gln Gly Ala Arg Glu Phe Ile Leu  
 290 295 300  
 Arg Met Phe Val Asp Leu Asn Pro Asp Pro Asp Lys Ile Ile Tyr Ser  
 305 310 315 320



His Phe Thr Cys Ala Thr Asp Thr Glu Asn Ile Arg Phe Val Phe Ala  
 325 330 335

Ala Val Lys Asp Thr Ile Leu Gln Leu Asn Leu Lys Glu Tyr Asn Leu  
 340 345 350

Val

<210> 11

<211> 353

<212> PRT

<213> Lymnaea stagnalis

<400> 11

Met Ala Cys Cys Ile Pro Asp Glu Leu Lys Glu Gln Lys Arg Ile Asn  
 1 5 10 15

Gln Glu Ile Glu Arg Gln Leu Lys Arg Asp Lys Arg Asp Ala Arg Arg  
 20 25 30

Glu Leu Lys Leu Leu Leu Leu Gly Thr Gly Glu Ser Gly Lys Ser Thr  
 35 40 45

Phe Ile Lys Gln Met Arg Ile Ile His Gly Ala Gly Tyr Ser Asp Glu  
 50 55 60

Asp Lys Arg Ser His Ile Lys Ile Val Tyr Gln Asn Ile Phe Met Ala  
 65 70 75 80

Met His Ala Met Ile Arg Ala Met Asp Thr Leu Asn Ile Gln Tyr Ile  
 85 90 95

Asn Pro Ala Asn Arg Glu Asn Gly Asn Met Ile Arg Gln Ile Asp Tyr  
 100 105 110

Glu Thr Val Thr Thr Phe Asp Lys Pro Cys Val Asp Ala Ile Ile Ser  
 115 120 125

Leu Trp Asn Asp Asp Gly Ile Gln Glu Cys Tyr Asp Arg Arg Arg Glu  
 130 135 140

Tyr Gln Leu Thr Asp Ser Ala Lys Tyr Tyr Leu Asp Ser Val Glu Arg  
 145 150 155 160

Ile Ser Gln Gln Asp Tyr Leu Pro Thr Leu Gln Asp Ile Leu Arg Val

165

170

175

Arg Val Pro Thr Thr Gly Ile Ile Glu Tyr Pro Phe Asp Leu Asp Ser  
180 185 190

Ile Ile Phe Arg Met Val Asp Val Gly Gly Gln Arg Ser Glu Arg Arg  
195 200 205

Lys Trp Ile His Cys Phe Glu Asn Val Thr Ser Ile Met Phe Leu Val  
210 215 220

Ala Leu Ser Glu Tyr Asp Gln Val Leu Val Glu Ser Asp Asn Glu Asn  
225 230 235 240

Arg Met Glu Glu Ser Lys Ala Leu Phe Arg Thr Ile Ile Thr Tyr Pro  
245 250 255

Trp Phe Gln Asn Ser Ser Val Ile Leu Phe Leu Asn Lys Lys Asp Leu  
260 265 270

Leu Glu Glu Lys Ile Met His Ser His Leu Val Asp Tyr Phe Pro Glu  
275 280 285

Phe Asp Gly Pro Lys Lys Glu Ala Ser Thr Ala Arg Glu Phe Ile Leu  
290 295 300

Lys Met Phe Val Glu Leu Asn Pro Asp Pro Asp Lys Ile Ile Tyr Ser  
305 310 315 320

His Phe Thr Cys Ala Thr Asp Thr Glu Asn Ile Arg Phe Val Phe Ala  
325 330 335

Ala Val Lys Asp Thr Ile Leu Gln Leu Asn Leu Lys Glu Tyr Asn Leu  
340 345 350

Val

&lt;210&gt; 12

&lt;211&gt; 353

&lt;212&gt; PRT

&lt;213&gt; Drosophila melanogaster

&lt;400&gt; 12

Met Glu Cys Cys Leu Ser Glu Glu Ala Lys Glu Gln Lys Arg Ile Asn  
1 5 10 15

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gln | Glu | Ile | Glu | Lys | Gln | Leu | Arg | Arg | Asp | Lys | Arg | Asp | Ala | Arg | Arg | 20  | 25  | 30  |
| Glu | Leu | Lys | Leu | Leu | Leu | Leu | Gly | Thr | Gly | Glu | Ser | Gly | Lys | Ser | Thr | 35  | 40  | 45  |
| Phe | Ile | Lys | Gln | Met | Arg | Ile | Ile | His | Gly | Ser | Gly | Tyr | Ser | Asp | Glu | 50  | 55  | 60  |
| Asp | Lys | Arg | Gly | Tyr | Ile | Lys | Leu | Val | Phe | Gln | Asn | Ile | Phe | Met | Ala | 65  | 70  | 75  |
| Met | Gln | Ser | Met | Ile | Lys | Ala | Met | Asp | Met | Leu | Lys | Ile | Ser | Tyr | Gly | 85  | 90  | 95  |
| Gln | Gly | Glu | His | Ser | Glu | Leu | Ala | Asp | Leu | Val | Met | Ser | Ile | Asp | Tyr | 100 | 105 | 110 |
| Glu | Thr | Val | Thr | Thr | Phe | Glu | Asp | Pro | Tyr | Leu | Asn | Ala | Ile | Lys | Thr | 115 | 120 | 125 |
| Leu | Trp | Asp | Asp | Ala | Gly | Ile | Gln | Glu | Cys | Tyr | Asp | Arg | Arg | Arg | Glu | 130 | 135 | 140 |
| Tyr | Gln | Leu | Thr | Asp | Ser | Ala | Lys | Tyr | Tyr | Leu | Ser | Asp | Leu | Ala | Arg | 145 | 150 | 155 |
| Ile | Glu | Gln | Ala | Asp | Tyr | Leu | Pro | Thr | Glu | Gln | Asp | Ile | Leu | Arg | Ala | 165 | 170 | 175 |
| Arg | Val | Pro | Thr | Thr | Gly | Ile | Leu | Glu | Tyr | Pro | Phe | Asp | Leu | Asp | Gly | 180 | 185 | 190 |
| Ile | Val | Phe | Arg | Met | Val | Asp | Val | Gly | Gly | Gln | Arg | Ser | Glu | Arg | Arg | 195 | 200 | 205 |
| Lys | Trp | Ile | His | Cys | Phe | Glu | Asn | Val | Thr | Ser | Ile | Ile | Phe | Leu | Val | 210 | 215 | 220 |
| Ala | Leu | Ser | Glu | Tyr | Asp | Gln | Ile | Leu | Phe | Glu | Ser | Asp | Asn | Glu | Asn | 225 | 230 | 235 |
| Arg | Met | Glu | Glu | Ser | Lys | Ala | Leu | Phe | Arg | Thr | Ile | Ile | Thr | Tyr | Pro | 245 | 250 | 255 |
| Trp | Phe | Gln | Asn | Ser | Ser | Val | Ile | Leu | Phe | Leu | Asn | Lys | Lys | Asp | Leu | 260 | 265 | 270 |

Leu Glu Glu Lys Ile Met Tyr Ser His Leu Val Asp Tyr Phe Pro Glu  
275 280 285

Tyr Asp Gly Pro Lys Gln Asp His Ala Ala Ala Lys Gln Phe Val Leu  
290 295 300

Lys Lys Tyr Leu Ala Cys Asn Pro Asp Pro Glu Arg Gln Cys Tyr Ser  
305 310 315 320

His Phe Thr Thr Ala Thr Asp Thr Glu Asn Ile Lys Leu Val Phe Cys  
325 330 335

Ala Val Lys Asp Thr Ile Met Gln Asn Ala Leu Lys Glu Phe Asn Leu  
340 345 350

Gly

<210> 13  
<211> 353  
<212> PRT  
<213> Drosophila melanogaster

<400> 13  
Met Glu Cys Cys Leu Ser Glu Glu Ala Lys Glu Gln Lys Arg Ile Asn  
1 5 10 15

Gln Glu Ile Glu Lys Gln Leu Arg Arg Asp Lys Arg Asp Ala Arg Arg  
20 25 30

Glu Leu Lys Leu Leu Leu Leu Gly Thr Gly Glu Ser Gly Lys Ser Thr  
35 40 45

Phe Ile Lys Gln Met Arg Ile Ile His Gly Ser Gly Tyr Ser Asp Glu  
50 55 60

Asp Lys Arg Gly Tyr Ile Lys Leu Val Phe Gln Asn Ile Phe Met Ala  
65 70 75 80

Met Gln Ser Met Ile Lys Ala Met Asp Met Leu Lys Ile Ser Tyr Gly  
85 90 95

Gln Gly Glu His Ser Glu Leu Ala Asp Leu Val Met Ser Ile Asp Tyr  
100 105 110

Glu Thr Val Thr Thr Phe Glu Asp Pro Tyr Leu Asn Ala Ile Lys Thr  
115 120 125

Leu Trp Asp Asp Ala Gly Ile Gln Glu Cys Tyr Asp Arg Arg Arg Glu  
130 135 140

Tyr Gln Leu Thr Asp Ser Ala Lys Tyr Tyr Leu Lys Asp Leu Asp Arg  
145 150 155 160

Val Ala Gln Pro Ala Tyr Leu Pro Thr Glu Gln Asp Ile Leu Arg Val  
165 170 175

Arg Val Pro Thr Thr Gly Ile Ile Glu Tyr Pro Phe Asp Leu Glu Glu  
180 185 190

Ile Arg Phe Arg Met Val Asp Val Gly Gly Gln Arg Ser Glu Arg Arg  
195 200 205

Lys Trp Ile His Cys Phe Glu Asn Val Thr Ser Ile Ile Phe Leu Val  
210 215 220

Ala Leu Ser Glu Tyr Asp Gln Ile Leu Phe Glu Ser Asp Asn Glu Asn  
225 230 235 240

Arg Met Glu Glu Ser Lys Ala Leu Phe Arg Thr Ile Ile Thr Tyr Pro  
245 250 255

Trp Phe Gln Asn Ser Ser Val Ile Leu Phe Leu Asn Lys Lys Asp Leu  
260 265 270

Leu Glu Glu Lys Ile Met Tyr Ser His Leu Val Asp Tyr Phe Pro Glu  
275 280 285

Tyr Asp Gly Pro Gln Arg Asp Ala Ile Thr Ala Arg Glu Phe Ile Leu  
290 295 300

Arg Met Phe Val Asp Leu Asn Pro Asp Ser Glu Lys Ile Ile Tyr Ser  
305 310 315 320

His Phe Thr Cys Ala Thr Asp Thr Glu Asn Ile Arg Phe Val Phe Ala  
325 330 335

Ala Val Lys Asp Thr Ile Leu Gln Ser Asn Leu Lys Glu Tyr Asn Leu  
340 345 350

Val

<210> 14

<211> 353  
<212> PRT  
<213> Homarus americanus

<400> 14

Met Ala Cys Cys Leu Ser Glu Glu Ala Lys Glu Gln Lys Arg Ile Asn  
1 5 10 15  
Gln Glu Ile Glu Arg Gln Leu Arg Lys Asp Lys Arg Asp Ala Arg Arg  
20 25 30  
Glu Leu Lys Leu Leu Leu Leu Gly Thr Gly Glu Ser Gly Lys Ser Thr  
35 40 45  
Phe Ile Lys Gln Met Arg Ile Ile His Gly Ala Gly Tyr Ser Asp Glu  
50 55 60  
Asp Lys Arg Gly Phe Ile Lys Leu Val Phe Gln Asn Ile Phe Met Ala  
65 70 75 80  
Met Gln Ser Met Ile Arg Ala Met Asp Leu Leu Gln Ile Ser Tyr Gly  
85 90 95  
Asp Ser Ala Asn Ile Glu His Ala Asp Leu Val Arg Ser Val Asp Tyr  
100 105 110  
Glu Ser Val Thr Thr Phe Glu Glu Pro Tyr Val Thr Ala Met Asn Ser  
115 120 125  
Leu Trp Gln Asp Thr Gly Ile Gln His Cys Tyr Asp Arg Arg Arg Glu  
130 135 140  
Tyr Gln Leu Thr Asp Ser Ala Lys Tyr Tyr Leu Thr Asp Leu Asp Arg  
145 150 155 160  
Ile Ala Ala Lys Asp Tyr Val Ser Thr Leu Gln Asp Ile Leu Arg Val  
165 170 175  
Arg Ala Pro Thr Thr Gly Ile Ile Glu Tyr Pro Phe Asp Leu Glu Glu  
180 185 190  
Ile Arg Phe Arg Met Val Asp Val Gly Gly Gln Arg Ser Glu Arg Arg  
195 200 205  
Lys Trp Ile His Cys Phe Glu Asn Val Thr Ser Ile Ile Phe Leu Val  
210 215 220  
Ala Leu Ser Glu Tyr Asp Gln Ile Leu Phe Glu Ser Asp Asn Glu Asn

225                      230                      235                      240  
 Arg Met Glu Glu Ser Lys Ala Leu Phe Lys Thr Ile Ile Thr Tyr Pro  
                          245                      250                      255  
 Trp Phe Gln His Ser Ser Val Ile Leu Phe Leu Asn Lys Lys Asp Leu  
                          260                      265                      270  
 Leu Glu Glu Lys Ile Met Tyr Ser His Leu Val Asp Tyr Phe Pro Glu  
                          275                      280                      285  
 Tyr Asp Gly Pro Arg Lys Asp Ala Ile Ala Ala Arg Glu Phe Ile Leu  
                          290                      295                      300  
 Arg Met Phe Val Glu Leu Asn Pro Asp Pro Glu Lys Ile Ile Tyr Ser  
 305                      310                      315                      320  
 His Phe Thr Cys Ala Thr Asp Thr Glu Asn Ile Arg Phe Val Phe Ala  
                          325                      330                      335  
 Ala Val Lys Asp Thr Ile Leu Gln Leu Asn Leu Lys Glu Tyr Asn Leu  
                          340                      345                      350  
 Val

<210> 15  
 <211> 353  
 <212> PRT  
 <213> Limulus polyphemus

<400> 15  
 Met Ala Cys Cys Leu Ser Glu Glu Gly Lys Glu Gln Lys Arg Ile Asn  
   1                          5                          10                          15  
 Gln Glu Ile Glu Arg Gln Leu Arg Lys Asp Lys Arg Asp Ala Arg Arg  
                           20                          25                          30  
 Glu Leu Lys Leu Leu Leu Leu Gly Thr Gly Glu Ser Gly Lys Ser Thr  
                           35                          40                          45  
 Phe Ile Lys Gln Met Arg Ile Ile His Gly Gln Gly Tyr Ser Asp Asp  
                           50                          55                          60  
 Asp Lys Lys Ser Tyr Ile Lys Leu Val Tyr Gln Asn Ile Ile Met Ala  
   65                          70                          75                          80

Met Gln Ser Met Asn Lys Ala Met Glu Met Leu Lys Ile Ser Tyr Lys  
 85 90 95  
 Asp Arg Asn Asn Ile Glu Asn Ala Glu Leu Val Leu Ser Val Asp Tyr  
 100 105 110  
 Glu Thr Val Thr Thr Phe Asp Ser Pro Tyr Val Glu Ala Ile Lys Ser  
 115 120 125  
 Leu Trp Val Asp Pro Gly Ile Gln Glu Cys Tyr Asp Arg Arg Arg Glu  
 130 135 140  
 Tyr Gln Leu Thr Asp Ser Ala Lys Tyr Tyr Leu Asn Asp Ile Asp Arg  
 145 150 155 160  
 Ile Ala Val Pro Asn Tyr Leu Pro Thr Gln Gln Asp Ile Leu Arg Val  
 165 170 175  
 Arg Val Pro Thr Thr Gly Ile Ile Glu Tyr Pro Phe Ile Leu Asp Ser  
 180 185 190  
 Ile Ile Phe Arg Met Val Asp Val Gly Gly Gln Arg Ser Glu Arg Arg  
 195 200 205  
 Lys Trp Ile His Cys Phe Glu Asn Val Thr Ser Ile Ile Phe Leu Val  
 210 215 220  
 Ala Leu Ser Glu Tyr Asp Gln Ile Leu Phe Glu Ser Asp Asn Glu Asn  
 225 230 235 240  
 Arg Met Glu Glu Ser Lys Ala Leu Phe Lys Thr Ile Ile Thr Tyr Pro  
 245 250 255  
 Trp Phe Leu Asn Ser Ser Val Ile Leu Phe Leu Asn Lys Lys Asp Leu  
 260 265 270  
 Leu Glu Glu Lys Ile Met Phe Ser His Leu Val Asp Tyr Phe Pro Glu  
 275 280 285  
 Tyr Asp Gly Pro Lys Lys Asp Ala Val Gln Gly Arg Glu Phe Ile Leu  
 290 295 300  
 Lys Met Phe Val Asp Leu Asn Pro Asp Ser Glu Lys Ile Ile Tyr Ser  
 305 310 315 320  
 His Phe Thr Cys Ala Thr Asp Thr Glu Asn Ile Arg Phe Val Phe Ala  
 325 330 335



Ala Val Lys Asp Thr Ile Leu Gln Leu Asn Leu Lys Glu Tyr Asn Leu  
 340 345 350

Val

<210> 16

<211> 354

<212> PRT

<213> Loligo forbesi

<400> 16

Met Ala Cys Cys Leu Ser Glu Glu Ala Lys Glu Gln Lys Arg Ile Asn  
 1 5 10 15

Gln Glu Ile Glu Lys Gln Leu Arg Arg Asp Lys Arg Asp Ala Arg Arg  
 20 25 30

Glu Leu Lys Leu Leu Leu Leu Gly Thr Gly Glu Ser Gly Lys Ser Thr  
 35 40 45

Phe Ile Lys Gln Met Arg Ile Ile His Gly Ser Gly Tyr Ser Glu Glu  
 50 55 60

Asp Arg Lys Gly Phe Glu Lys Ile Val Tyr Gln Asn Ile Phe Ser Ala  
 65 70 75 80

Ile Gln Thr Leu Ile Ala Ala Met Glu Thr Leu Ser Leu Glu Tyr Lys  
 85 90 95

Asp Pro Ser Asn Asn Glu His Ala Glu Phe Leu Asn Ser Ile Asp Ala  
 100 105 110

Asp Ser Ala Asp Ile Phe Glu Asp Gly His Val Thr Ala Ile Lys Gly  
 115 120 125

Cys Trp Thr Asp Pro Gly Met Gln Glu Cys Tyr Asp Arg Arg Arg Glu  
 130 135 140

Tyr Gln Leu Thr Asp Ser Ala Lys Tyr Tyr Leu Asp Asp Val Glu Arg  
 145 150 155 160

Ile His Glu Pro Gly Tyr Ile Pro Thr Leu Gln Asp Ile Leu Arg Val  
 165 170 175

Arg Val Pro Thr Thr Gly Ile Ile Glu Tyr Pro Phe Asp Leu Tyr Ser  
 180 185 190

Ile Ile Phe Arg Met Val Asp Val Gly Gly Gln Arg Ser Glu Arg Arg  
 195 200 205

Lys Trp Ile His Cys Phe Glu Asn Val Thr Ser Ile Met Phe Leu Val  
 210 215 220

Ala Leu Ser Glu Tyr Asp Gln Val Leu Val Glu Ser Asp Asn Glu Glu  
 225 230 235 240

Asn Arg Met Glu Glu Ser Lys Ala Leu Phe Arg Thr Ile Ile Thr Tyr  
 245 250 255

Pro Trp Phe Gln Asn Ser Ser Val Ile Leu Phe Leu Asn Lys Lys Asp  
 260 265 270

Leu Leu Glu Glu Lys Ile Met Thr Ser His Leu Ala Asp Tyr Phe Pro  
 275 280 285

Asp Tyr Asp Gly Pro Lys Cys Asp Tyr Glu Ala Ala Arg Glu Phe Met  
 290 295 300

Met Asp Ser Tyr Met Asp Leu Asn Glu Asp Lys Glu Lys Met Leu Tyr  
 305 310 315 320

Tyr His Tyr Thr Cys Ala Thr Asp Thr Glu Asn Ile Arg Phe Val Phe  
 325 330 335

Ala Ala Val Lys Asp Thr Ile Leu Gln Leu Asn Leu Lys Glu Tyr Asn  
 340 345 350

Leu Val

<210> 17

<211> 355

<212> PRT

<213> Caenorhabditis elegans

<400> 17

Met Ala Cys Cys Leu Ser Glu Glu Ala Arg Glu Gln Lys Arg Ile Asn  
 1 5 10 15

Gln Glu Ile Glu Lys Gln Leu Gln Arg Asp Lys Arg Asn Ala Arg Arg  
 20 25 30

Glu Leu Lys Leu Leu Leu Leu Gly Thr Gly Glu Ser Gly Lys Ser Thr

45

Pro Glu Tyr Asp Gly Pro Pro Arg Asp Pro Ile Ala Ala Arg Glu Phe

290 295 300

Ile Leu Lys Met Phe Val Asp Leu Asn Pro Asp Ala Asp Lys Ile Ile  
 305 310 315 320

Tyr Ser His Phe Thr Cys Ala Thr Asp Thr Glu Asn Ile Arg Phe Val  
 325 330 335

Phe Ala Ala Val Lys Asp Thr Ile Leu Gln His Asn Leu Lys Glu Tyr  
 340 345 350

Asn Leu Val  
 355

<210> 18  
 <211> 355  
 <212> PRT  
 <213> Geodia cydonium

<400> 18

Met Ser Cys Leu Leu Ser Glu Glu Glu Arg Leu Gln Lys Arg Ile Asn  
 1 5 10 15

Thr Arg Ile Asn Arg Glu Leu Gln Arg Asp His Lys Asp Ala Lys Lys  
 20 25 30

Glu Ile Lys Leu Leu Leu Leu Gly Thr Gly Glu Ser Gly Lys Ser Thr  
 35 40 45

Phe Ile Lys Gln Met Arg Ile Ile His Gly Lys Gly Tyr Ser Lys Gln  
 50 55 60

Asp Cys Leu Glu Tyr Lys Asn Leu Val Phe Arg Asn Ile Leu Met Ser  
 65 70 75 80

Met His Ser Met Leu Gln Ala Thr Ala Glu Leu Lys Ile Ala Tyr Ile  
 85 90 95

Asp Pro Asp Ala Gln Arg His Val Gln Leu Leu Met Ala Leu Arg Pro  
 100 105 110

Glu Thr Ala Gln Ser Leu Gly Gly Glu Thr Cys Glu Ala Ile Arg Lys  
 115 120 125

Leu Trp Gln Asp Ala Gly Val Gln Glu Cys Tyr Gln Arg Arg Asn Glu  
 130 135 140

Tyr Gln Leu Ser Asp Ser Thr Lys Tyr Tyr Leu Asp Asp Leu Pro Arg  
 145 150 155 160

Ile Ser Ser Asn Asp Tyr Val Pro Thr Thr Gln Asp Val Leu Arg Val  
 165 170 175

Arg Val Pro Thr Thr Gly Ile Asn Glu Tyr Pro Phe Thr Ile Asn Lys  
 180 185 190

Ile Ile Phe Lys Met Val Asp Val Gly Gly Gln Arg Ser Glu Arg Arg  
 195 200 205

Lys Trp Ile His Cys Phe Asp His Val Thr Ser Val Met Phe Leu Val  
 210 215 220

Ala Ile Ser Glu Tyr Asp Gln Ile Leu Val Glu Ala Asp Ser Arg Val  
 225 230 235 240

Asn Arg Met Val Glu Ser Leu His Leu Phe Asn Thr Ile Ile Ser Tyr  
 245 250 255

Pro Trp Phe Asn Lys Ser Ser Ile Ile Leu Phe Leu Asn Lys Lys Asp  
 260 265 270

Leu Leu Glu Glu Lys Val Met His Ser His Leu Ile Asp Tyr Phe Glu  
 275 280 285

Glu Tyr Asp Gly Pro Lys Cys Asp His Val Ser Ala Arg Glu Ser Ile  
 290 295 300

Ala Lys Met Phe Ile Ser Ile Asn Asp Met Arg Ser Ala Asp Ile Tyr  
 305 310 315 320

Pro His Phe Thr Cys Ala Thr Asp Thr Glu Asn Ile Lys Phe Val Phe  
 325 330 335

Asp Val Val Lys Asn His Ile Leu Gln Gln His Ile Thr Glu Val Val  
 340 345 350

Pro Gly Leu  
 355

<210> 19

<211> 25

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer

<400> 19

gaatatgatg gaccccagag agatg

25

<210> 20

<211> 52

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer

<400> 20

gacccctcgag ttagcacagt ccgatgtact tcagggttcaa ctggaggatg gt

52

<210> 21

<211> 52

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer

<400> 21

gacccctcgag ttagtacagt ccgcattcct tcagggttcaa ctggaggatg gt

52

<210> 22

<211> 52

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer

<400> 22

gacccctcgag ttagtaaagc ccacattcct tcagggttcaa ctggaggatg gt

52

<210> 23

<211> 52

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer

<400> 23

gatcctcgag ttagagcagc tcgtattgct tcagggtcaa ctggaggatg gt 52

<210> 24

<211> 58

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer

<400> 24

ggaaaaaagc ggccgcttaa aacagtccgc agtccttcag gttcaactgg aggatggt 58

<210> 25

<211> 32

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer

<400> 25

ggggtaccgc cgccatggcc tgctgtttat cc 32

<210> 26

<211> 35

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer

<400> 26

gctctagatt acaccaagtt gtactccttc agatt 35

<210> 27

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer

<400> 27

ctctccgatc tccgacggct g

21

<210> 28

<211> 64

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer

<400> 28

ttctacagca taatctgaag tatatcggtt tgtgttaatc tagagggcc gtttaaacc 60  
gctg 64

<210> 29

<211> 64

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer

<400> 29

cagcgggtt aaacgggcc tctagattaa cacaaaccga tatacttcag attatgctgt 60  
agaa 64

<210> 30

<211> 46

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer

<400> 30

cagcataatc tgaaggagtg tggattgtac taatctagag ggcccg

46

<210> 31

<211> 46

<212> DNA



<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer

<400> 31

cgggccctct agattagtag aatccacact ccttcagatt atgctg

46

<210> 32

<211> 69

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer

<400> 32

ggaaaaaagc ggccgcttag agcagctcgt attgcctcag gtgcatctgg aggatggtgt 60  
ccttgacgg 69

<210> 33

<211> 63

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer

<400> 33

gctctagatt agagcagctc gtattgcctc aggtgcatct gtagaattgt gtctttgacg 60  
gcg 63

<210> 34

<211> 63

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer

<400> 34

gctctagatt aacatagccc tatgtatatt agattattct gtagaattgt gtctttgacg 60  
gcg 63

<210> 35  
<211> 98  
<212> DNA  
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer

<400> 35  
gctctagatt agagcagctc gtattgcctc aggtgcatac gttgaataat gtcacgacag 60  
tcattaaanaa cacgccgaat gttttccgta tcagtcgc 98

<210> 36  
<211> 6  
<212> PRT  
<213> vertebrate

<400> 36  
Met Thr Leu Glu Ser Ile  
1 5

<210> 37  
<211> 21  
<212> PRT  
<213> invertebrate

<400> 37  
Phe Val Phe Ala Ala Val Lys Asp Thr Ile Leu Gln His Asn Leu Lys  
1 5 10 15  
Glu Tyr Asn Leu Val  
20

<210> 38  
<211> 21  
<212> PRT  
<213> vertebrate

<400> 38  
Phe Val Phe Asp Ala Val Thr Asp Val Ile Ile Gln Asn Asn Leu Lys  
1 5 10 15  
Tyr Ile Gly Leu Cys  
20

<210> 39  
<211> 21  
<212> PRT  
<213> vertebrate

<400> 39  
Arg Val Phe Asn Asp Cys Arg Asp Ile Ile Gln Arg Met His Leu Arg  
1 5 10 15

Gln Tyr Glu Leu Leu  
20

<210> 40  
<211> 21  
<212> PRT  
<213> vertebrate

<400> 40  
Phe Val Phe Asp Ala Val Thr Asp Val Ile Ile Lys Asn Asn Leu Lys  
1 5 10 15

Glu Cys Gly Leu Tyr  
20

<210> 41  
<211> 353  
<212> PRT  
<213> Drosophila melanogaster

<400> 41  
Met Glu Cys Cys Leu Ser Glu Glu Ala Lys Glu Gln Lys Arg Ile Asn  
1 5 10 15

Gln Glu Ile Glu Lys Gln Leu Arg Arg Asp Lys Arg Asp Ala Arg Arg  
20 25 30

Glu Leu Lys Leu Leu Leu Leu Gly Thr Gly Glu Ser Gly Lys Ser Thr  
35 40 45

Phe Ile Lys Gln Met Arg Ile Ile His Gly Ser Gly Tyr Ser Asp Glu  
50 55 60

Asp Lys Arg Gly Tyr Ile Lys Leu Val Phe Gln Asn Ile Phe Met Ala  
65 70 75 80

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Gln | Ser | Met | Ile | Lys | Ala | Met | Asp | Met | Leu | Lys | Ile | Ser | Tyr | Gly | 85  | 90  | 95  |     |
| Gln | Gly | Glu | His | Ser | Glu | Leu | Ala | Asp | Leu | Val | Met | Ser | Ile | Asp | Tyr | 100 | 105 | 110 |     |
| Glu | Thr | Val | Thr | Thr | Phe | Glu | Asp | Pro | Tyr | Leu | Asn | Ala | Ile | Lys | Thr | 115 | 120 | 125 |     |
| Leu | Trp | Asp | Asp | Ala | Gly | Ile | Gln | Glu | Cys | Tyr | Asp | Arg | Arg | Arg | Glu | 130 | 135 | 140 |     |
| Tyr | Gln | Leu | Thr | Asp | Ser | Ala | Lys | Tyr | Tyr | Leu | Lys | Asp | Leu | Asp | Arg | 145 | 150 | 155 | 160 |
| Val | Ala | Gln | Pro | Ala | Tyr | Leu | Pro | Thr | Glu | Gln | Asp | Ile | Leu | Arg | Val | 165 | 170 | 175 |     |
| Arg | Val | Pro | Thr | Thr | Gly | Ile | Ile | Glu | Tyr | Pro | Phe | Asp | Leu | Glu | Glu | 180 | 185 | 190 |     |
| Ile | Arg | Phe | Arg | Met | Val | Asp | Val | Gly | Gly | Gln | Arg | Ser | Glu | Arg | Arg | 195 | 200 | 205 |     |
| Lys | Trp | Ile | His | Cys | Phe | Glu | Asn | Val | Thr | Ser | Ile | Ile | Phe | Leu | Val | 210 | 215 | 220 |     |
| Ala | Leu | Ser | Glu | Tyr | Asp | Gln | Ile | Leu | Phe | Glu | Ser | Asp | Asn | Glu | Asn | 225 | 230 | 235 | 240 |
| Arg | Met | Glu | Glu | Ser | Lys | Ala | Leu | Phe | Arg | Thr | Ile | Ile | Thr | Tyr | Pro | 245 | 250 | 255 |     |
| Trp | Phe | Gln | Asn | Ser | Ser | Val | Ile | Leu | Phe | Leu | Asn | Lys | Lys | Asp | Leu | 260 | 265 | 270 |     |
| Leu | Glu | Glu | Lys | Ile | Met | Tyr | Ser | His | Leu | Val | Asp | Tyr | Phe | Pro | Glu | 275 | 280 | 285 |     |
| Tyr | Asp | Gly | Pro | Gln | Arg | Asp | Ala | Ile | Thr | Ala | Arg | Glu | Phe | Ile | Leu | 290 | 295 | 300 |     |
| Arg | Met | Phe | Val | Asp | Leu | Asn | Pro | Asp | Ser | Glu | Lys | Ile | Ile | Tyr | Ser | 305 | 310 | 315 | 320 |
| His | Phe | Thr | Cys | Ala | Thr | Asp | Thr | Glu | Asn | Ile | Arg | Phe | Val | Phe | Ala | 325 | 330 | 335 |     |

Ala Val Lys Asp Thr Ile Leu Gln Ser Asn Leu Lys Tyr Ile Gly Leu  
 340 345 350

Cys

<210> 42  
 <211> 36  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: primer

<400> 42  
 cggggtaccc cggttagcat ggagtgtgt ttatcg 36

<210> 43  
 <211> 40  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: primer

<400> 43  
 ccggaattcc ggtagacca aattatattc cttaaggttc 40

<210> 44  
 <211> 25  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: primer

<400> 44  
 gagcatcgat tacgagaccg ttacc 25

<210> 45  
 <211> 53  
 <212> DNA  
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer

<400> 45

cggaattctt agcacagtcc gatgtactta aggttcgatt gcagaattgt gtc

53